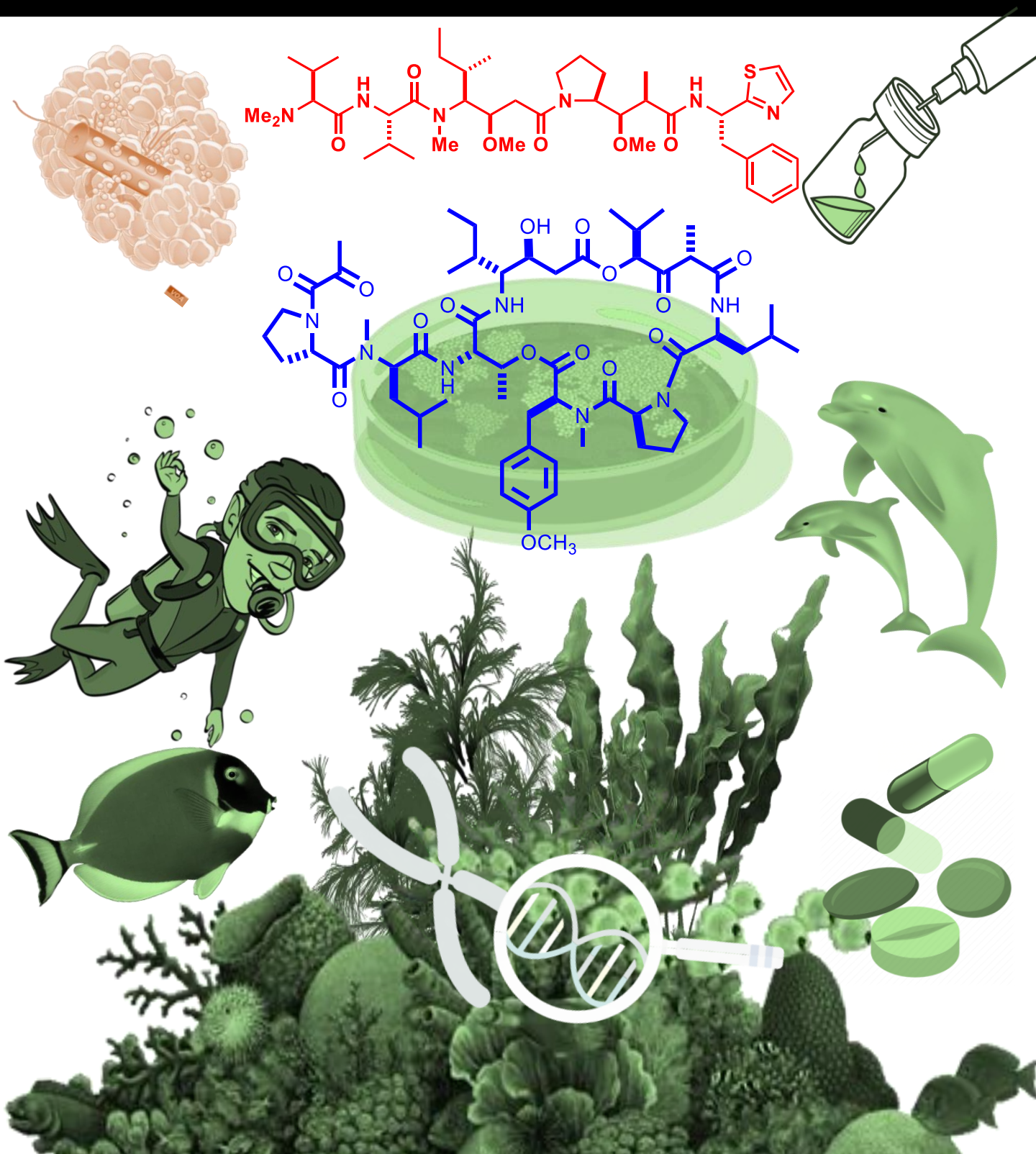
Compounds 2021 - 2022

Marine Drugs



Marine Toxins

Name	Nature	Source	{Suggested} Medical use
Tetrodotoxin TTX **Halneuron®** **Strong sodium channel blocker**	Polyether + Guanidine {Alkaloid}	*Pseudoalteromonas* a micro-organism living on symbiosis with Puffer fish	Strong pain killer – 3000 times active than morphine - in chronic cancer pain
Brevetoxin B pbTX **Exaggerates** **Sodium influx**	Cyclic Polyether	*Gymnodinium breve* *a dinoflahellate* living on Shellfish	Syndrome of Improper Anti-Diuretic Hormone Secretion {SIADH}. Cardiotonic {positive ionotropic activity}
Ciguatoxin CTX **Exaggerates sodium influx**	Cyclic Polyether	*Gambierdiscus toxicus* living on Moral eel	Syndrome of Improper Anti-Diuretic Hormone Secretion {SIADH}. Cardiotonic {positive ionotropic activity
Maitotoxin MTX **Exaggerates calcium influx**	Cyclic Polyether	*Gambierdiscus toxicus* living on Maito fish	Vasoconstrictor in hypotension {Lead Drug }
Palytoxin PTX **Inhibits Na^+/K^+ ATPase + increases Ca^{++} influx**	Cyclic Polyether	Palythoa toxicus	Alternative to digoxin {Cardiotonic} – Was used in USA for SIADH {High toxicity}
Jellyfish Toxins **Increasing K^+ influx**	Polypeptide Maine one consists of 47 amino acids	Jellyfish	Lead Drug for Cardiac arrhythmia

Approved Marine Pharmaceuticals

Name	Trade Name	Organism	Class	Target	Disease
Cytarabine (Ara-C)	Cytosar-U®	*Streptomyces* Micro-organism on a Sponge	Nucleoside	DNA Polymerase	Cancer
Vidarabine (Ara-A)	Vira-A®	*Streptomyces* Micro-organism on a Sponge	Nucleoside	DNA Polymerase	Antiviral
Plitidepsin	Aplidin®	Tunicate	Depsipeptide	Apoptosis	Cancer
Eribulin	Halaven®	Sponge	Polyketide	Microtubules Destabilization	Breast Cancer
Ziconotide	Prialt®	Cone Snail	Polypeptide	N-Type Ca^{2+} Channel {Neurons}	Pain killer
Tetrodotoxin	Halneuron®	Puffer fish	Polyether Alkaloid	Sodium Channel Blocker	Strong pain killer

Approved Marine Pharmaceuticals

Name	Trade Name	Organism	Class	Target	Disease
Brentuximab	ADCETRIS®	Mollusk	Polypeptide monoclonal antibody conjugate	Microtubules Stabilizer	Lymphoma cancer
Belantamab	Blenrep®	Mollusk	Polypeptide monoclonal antibody conjugate	Microtubules Stabilizer	Multiple Myeloma cancer
Trabectedin	Yondelis®	Tunicate	Alkaloid	DNA alkylation	Colo-rectal cancer
Lurbinectedin	Zepzelca®	Tunicate	Alkaloid	DNA alkylation	Lung cancer
Omega-3-Fatty Acids	Fish oil® Lovaza®	Fish	Omega-3 Fatty Acids	Triglyceride-Synthesizing Enzymes	Cardiovascular protective
Pseudopterosin A	Pseudopterosin A®	Soft coral *Pseudoterogorgia elisabethae*	Diterpene phenol	Inhibition of COX I and COX II	Skin trauma

Marine Chemical Ecology

Name	Trade Name	Organism	Class	Target
ω-conotoxin	Ziconotide Prialt®	Symbiotic *Pseudoalteromonas* on Puffer fish	Cyclic polypeptide 25 amino acids	Pain killer – calcium channel blocker – 1000 time more active than morphine
Dolastatin 10	----------	Snail *Conus magus* predating on fish	Linear Polypeptide	Lymphoma – Antimitotic Modified to obtain Brentuximab
Aplysiatoxin	--------	*Dollabella* Sea hare predating on cyanobacteria	Macrolide polyketide	Cytotoxic in small doses – Protein kinase inhibitor
Polyalogenated monoterpenes	----------	Red alga *Plocamium* defending themselves from sea hares	Monoterpenes	Cytotoxic in breast cancer – One of them is 5 times more active than taxol – Alkylating agent
Pentabromo-pseudalin	----------	*M.O. Altermonas* living on Brine Shrimp eggs preventing fungal infection	Phenol	Anti-fungal
Stypoldione **Dione = 2 Ketones**	----------	Brown alga *Stypopodium zonale* killing snails	Diterpene Diketone	Na+ Channel blocker Pain and convulsion